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09/548,637	04/13/2000	John R Koza	50291.P009	6771

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EXAMINER
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WONG, LUT

ART UNIT	PAPER NUMBER
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2129

MAIL DATE	DELIVERY MODE
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12/10/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



## Office Action Summary

Application No.

09/548,637

Applicant(s)

KOZA ET AL.

Examiner

Lut Wong

Art Unit

2129

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4-13-2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_



### **DETAILED ACTION**

This office action is responsive to an RCE AMENDMENT entered May 03, 2004 for the patent application 09/548637.

#### ***Status of Claims***

Claims 1-23 are pending. Claims 1, 14, 22-23 have been amended. Note: claim 23 lines 3-4, the amended limitation of "reference structure" should have been underlined to comply with 37CFR 1.121.

#### ***Information Disclosure Statement***

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Unless these references have been cited by the examiner on form PTO-892, they have not been considered.

#### ***Specification***

The disclosure is objected to because of the following informalities:

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification. For example,



1) Pg.38 L12 and pg 89 L6: "block 143" should be "block 147".

2) pg. 105-110: all instances of "36xx" should be "30xx". E.g. "The Host 3650" should be "The Host 3050". Similarly, all instance of "37xx" should be "31xx".

Furthermore, all instance of "24xx" should be "32xx".

Appropriate correction is required.

### ***Drawings***

New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because some labels are in hand writing which is hard to read. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

### ***Claim Objections***

**Claims 1, 15, 22, and 23 are objected to because of the following informalities:**

Claims 1 and 23 line 5: change "the reference art" to "the reference structure".

Claim 15: change "requirement-is" to "requirement is".

Claim 22 Line 7: change "a reference structure" to "the reference structure".

Appropriate correction is required.



***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

**Claim 23 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.**

Claim 23 constitute software modules devoid of any apparent hardware, and therefore are computer programs e.g., functional descriptive material. Since the computer programs are not embodied on an appropriate computer-readable storage "medium, they cannot be afforded patent eligibility. The intrinsic evidence of inappropriate computer readable medium, i.e. signals, can be found at applicant's disclosure pg. 33 L10-11.

***Claim Rejections - 35 USC § 101***

**Claims 1-23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.**

The claims fail to provide a tangible result, and there must be a practical application, by either

- 1) transforming (physical thing) or
- 2) by having the FINAL RESULT (not the steps) achieve or produce  
a useful (specific, substantial, AND credible),  
concrete (substantially repeatable/non-unpredictable), AND



tangible (real world/non-abstract) result.

A claim that is so broad that it reads on both statutory and non-statutory subject matter must be amended. If the specification discloses a practical application but the claim is broader than the disclosure such that it does not require the practical application, then the claim must be amended. A claim that recites a computer that solely calculates a mathematical formula is not statutory.

In instant case, **claims 1-23** are drawn to an *iterative* computer-implemented process for creating an entity. The claimed method iteratively determines a fitness value, select an entity, and create new entity. It is considered as pure data manipulation. Such, in and of itself, is not believed to be directed to a practical application which produces a useful, concrete and tangible result. Specifically,

1) It is an endless loop with no result at all. The claimed method does not specify when the iteration ends. As such, the claimed invention is not believed to be directed to a practical application which produces a useful, concrete and tangible result.

2) The preamble is not supported by the claim body. The preamble of claim 1 recites "An iterative computer-implemented process for *creating an entity that satisfies a predetermined design requirement* that at least one characteristic is not in a reference structure." The claim body, however, only iteratively selects and creates entity. Nowhere does the claim body supports *creating an entity that satisfies a predetermined design requirement*.

3) The preamble is not supported by the specification either. Pg. 53 Lines 6-8 of the spec recites "There is *no guarantee of a successful outcome* of any particular run of



genetic programming on any particular previously unseen problem.” As clearly pointed out from the spec, and well known in the art, there is no guarantee of success. How can the specification supports the limitation of “creating an entity that satisfies a predetermined design requirement”?

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

**Claims 1-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.**

Claims 1, 14, 22-23 have been amended to recite new limitations. There are no supports for such limitations. Applicant did not recite where support can be found in the spec for the amended limitation. Applicant should specifically point out the support for any amendments made to the disclosure. See MPEP 2163.06 and 714.02. Specifically, where in the spec supports “reference structure”, “predetermined threshold” as recited in claims 1, 23?



Claims 9-11 recite terms such as “externally invokable sub-entity”, “internally invokable sub-entity”, “invocation”. Where in the spec supports these terms? Also, where exactly in the spec supports the claim limitation of claims 9-11?

Any claim not specifically addressed, above, is being rejected as incorporating the deficiencies of a claim upon which it depends.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claims 1, 22, and 23: claim 1 recite “An iterative computer-implemented process for creating an entity *that* satisfies a predetermined design requirement *that* at least one characteristic is not in a reference structure, *the process invoking iterations*, each iteration comprising”. It is not clear what applicant is intended to claim because the sentence is fragmented. Also, what is the meaning of “the process *invoking* iterations”? The Examiner understands that an iterative process involves iteration; however, the phrase is redundant and confusing. How does the process “invoke” iterations? Claims 22 and 23 recite similar limitation as claim 1. It is also not clear what applicant is intended to claim.



Claim 7 recites "genetic programming operations". There is no explicit and deliberate definition of "genetic programming operations". The spec only provides exemplary "genetic operations" (See pg.97 L18-20). The Examiner contends that the metes and bounds for "genetic programming operations" is not defined because the term is subjective and vague. One of ordinary skill in the art would not know what operation is included and what is not. Take *k-point* crossover for example, is it considered as "genetic programming operations"?

Claim 8 recites "genetic algorithm operations". It is rejected for the same reason as claim 7. Also, how are they different? i.e. what is the difference between "genetic programming operations" and "genetic algorithm operations"? Since these terms are not defined, one of ordinary skill in the art would have to guess the difference.

Claims 9-11 recite terms such as "externally invokable sub-entity", "internally invokable sub-entity". What are these terms? The word "invokable" is not even defined in a dictionary. Since the spec fails to support the claim limitation of claims 9-11, the Examiner does not understand what the applicant is intended to claim.

Claim 12 recites "architecture-altering operations". It is rejected for the same reason as claim 7.

Claim 14 recites "The process defined in Claim 1 further comprising supplying, from an external source, the at least one candidate entity partially satisfying the predetermined design requirement or that only partially includes a characteristic of the reference structure". 1) The sentence is fragmented. 1) It is not clear what the applicant is intended to claim. 3) "*the* at least one candidate entity partially satisfying the



predetermined design requirement” lacks antecedent basis. Claim 1 does not recite “at least one candidate entity partially satisfying the predetermined design requirement”

Claim 15 recites “The process defined in Claim 1 wherein selecting a candidate entity that more closely satisfies the design requirement-is ascertained by evaluating the candidate entity by simulating the candidate entity.” 1) The term “more closely” is a relative term which renders the claim indefinite. The term “more closely satisfies” is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. 2) “Claim 1 *wherein selecting a candidate entity that more closely satisfies the design requirement*” lacks antecedent basis. Claim 1 does not recite “selecting a candidate entity that more closely satisfies the design requirement”.

Claim 16 is rejected for the same reason as claim 15.

Claim 17 recites “constrained syntactic structure”. It is rejected for the same reason as claim 7.

Any claim not specifically addressed, above, is being rejected as incorporating the deficiencies of a claim upon which it depends.

### ***Claim Rejections - 35 USC § 112***

**Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01.**



Claims 1, 22, and 23: The omitted steps are: the termination of the iterative process. Without the termination step, the iteration runs forever.

Any claim not specifically addressed, above, is being rejected as incorporating the deficiencies of a claim upon which it depends.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior arts (APA) by Koza et al, (US 5867397) and in view of another APA (Ullman, J.R).**

Claims 1, 22-23 are drawn to creating a novel design using genetic programming. Koza et al teaches creating design that satisfy technical requirement by using genetic programming (See e.g. spec pg. 2, 9, 11-13, 37). Koze et al teaches determining fitness of entities, selecting entities, and creating new entities (See e.g. spec pg. 9). Koza et al does not teach creating *novel design* that satisfying both technical requirement and having characteristic not in prior art. However, one of ordinary skill in the art would know that the only difference in "creating a design" to "creating a *novel design*" is adding one more constraint to the multiobjective function.



Such constraint is, of course, requiring the designed entity having characteristic not in prior art. Hence, one of ordinary skill in the art whom is aware of "novelty design" would immediately motivated to added another variable in the objective function or fitness measure to obtain a predictable result of "creating novel design". Isomorphism value, as admitted by the applicant, is one of the many well known method that can be used to represent dissimilarity between candidate entity and the prior art (See e.g. spec pg. 95). Hence, one of ordinary skill in the art could have applied the isomorphism value together with the technical requirement as a measure of fitness to achieve the predictable result of "creating novel design". It is merely applying known technique to known method. See *KSR International Co. v. Teleflex Inc.*, 550 U.S.--, 82 USPQ2d 1385 (2007).

Claim 2: APA (See e.g. spec pg. 9 L15 on mutation).

Claim 3: APA (See e.g. spec pg. 92 on simulating annealing).

Claim 4: APA (See e.g. spec pg. 2 on hill climbing).

Claim 5: APA (See e.g. spec pg. 9 on population).

Claim 6: APA (See e.g. spec pg. 9 L13 on crossover).

Claim 7: APA (See e.g. spec pg. 2 on genetic programming operations).

Claim 8: APA (See e.g. spec pg. 2 on genetic algorithm operations).

Claims 9-11: (See the 112 rejection above).

Claim 12: APA (See e.g. spec pg. 8 on architecture altering operation).

Claim 13: APA (See e.g. spec pg. 9 L3 on random process).

Claim 14: (See the 112 rejection above).



Claim 15: APA (See e.g. spec pg. 37 on simulation).

Claim 16: APA (See e.g. spec pg. 37 on no simulation).

Claim 17: APA (See e.g. spec pg. 16 L15-17 on constrained syntactic structure).

Claim 18: APA (See e.g. spec pg. 11 L16-20, pg. 12 L10-20 on electrical circuit).

Claim 19: APA (See e.g. spec pg. 11 L21-pg 12 L4 on controller).

Claim 20: APA (See e.g. spec pg. 12 L4-6, pg. 13 L3-7 on antenna).

Claim 21: a mechanical system is obvious over circuit, controller, and antenna. It is merely a simple substitution of one known, equivalent element for another to obtain predictable result. I.e. one can evolve a mechanical system using the same method that evolve circuit, controller and antenna. The only difference is substituting electrical component with mechanical component.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-23 are rejected under 35 U.S.C. 102(b) as being anticipated by**

**Koza et al ("Genetic Programming as a Darwinian Invention Machine" Euro-GP,**

**May 26-27, 1999) Examiner Note: although the conference was held on May 1999,**

**the paper was submitted Feb 19, 1999. The submitted paper qualifies 102(b) date**



**and there is no confidential agreement on the submission, hence the paper was known to the public on Feb 19, 1999.**

Claims 1-23: Koza et al anticipates using genetic programming to create novel designs (See at least the abstract). Examiner Note: the cited reference is applicant's own work. It is 102(b) bar.

### ***Response to Arguments***

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lut Wong whose telephone number is (571) 270-1123. The examiner can normally be reached on M-F 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vincent David can be reached on (571) 272-3080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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/Lut Wong/  
Patent Examiner, AU 2129

  
DAVID VINCENT  
SUPERVISORY PATENT EXAMINER